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TIMBER MANAGEMENT PLAN
JICARILLA WORKING CIRCLE
CARSON NATIONAL FOREST
REGION 3
SECOND REVISION
F.Y 1963 THROUGH F.Y. 1972

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TIMBER MANAGEMENT PLAN

JICARILLA WORKING CIRCLE

CARSON NATIONAL FOREST
Region Three

SECOND REVISION
F.Y. 1963 THROUGH F.Y. 1972

APPROVED: August 27, 1963

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SECOND REVISION

TIMBER MANAGEMENT PLAN

JICARILLA WORKING CIRCLE

CARSON NATIONAL FOREST

REGION 3

1963

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June 29, 1963

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June 29, 1963

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Divisions	Forest		Regional Office		Washington Office	
	Initials	Date	Initials	Date	Initials	Date
Timber Management	J.H.H.	7/1/63	D.J.K.	7/12/63	D.J.M.	8/27/63
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II. SUMMARY OF THE PLAN

A. Management Objectives for the Working Circle.

Past cutting practices on the Jicarilla Working Circle were designed to harvest the anticipated mortality of the virgin stands. Future management will be based on even-aged stands which will be cut under area controls. Management decisions herein are designed to make the conversion of the Working Circle into stands with planned size-age and basal area.

1. The principal objective of management of the commercial forest lands is to obtain continuous production at a level as high as is economically practicable, giving consideration to both quantity and quality and in accordance with the principle of multiple use.

2. On sites in the Administrative Working Group area, the objectives are to protect, improve, harvest, and maintain stands of timber which will be adequate for the uses of the area.

3. All deforested areas will be reforested through planting, direct seeding, site preparation, or natural regeneration.

4. During this cutting period, the initial harvest of all commercial virgin timberlands will be completed.

5. The working circle has been divided into compartments of approximately 1,000 to 5,000 acres. Each compartment will be mapped by stand age, by stand condition, and by site index. A silvicultural prescription will be prepared for each stand.

6. Growth data will be developed for each stand based on age, on site index, and on basal area stocking.

7. Management will be even-aged and cutting will be controlled by area, with volume checks.

8. Understocked stands will be brought to optimum stocking through growth and through planting or direct seeding.

9. Disease will be removed from the stands through cutting practices.

10. The quality of the stands will be improved through pre-commercial thinning and through intermediate commercial cuts.

11. As fully as possible, all usable dead or deteriorating timber will be recovered.

12. A balance of 20-year-age classes will be attained by area. At least one full rotation period will be required. A major adjustment will be achieved over the next 60 years in an orderly fashion.

B. Area and Volume Summaries1. Ownership Status

Table 1.

Ownership Class	All Lands Acres	Commercial Forest Lands			
		Acres	Net Volume Mbf		Net M Cu.Ft. 5"+
			Scribner 12"+	Int. $\frac{1}{4}$ " 9"+	
National Forest	154,822	43,707	167,755	192,918	31,159
Private	3,884	0	0	0	0
Total	158,706	43,707	167,755	192,918	31,159

2. Commercial Forest Land, National Forest Only

Table 2.

Stand Size or Condition Class	Acres	Sawtimber				Poles	Total M Cu.Ft.
		Scribner Bd.Ft.		Int. $\frac{1}{4}$ " Bd.Ft.	M Cu.Ft.	M Cu.Ft.	
		8-11"	12"+	9"+	9"+	5-8"	
Technical		← Mbf Net Volumes →			← Net Volumes →		
Working Group							
Virgin Saw-	20,755	1,660	97,686	112,338	17,444	156	17,600
timber							
Cutover							
Sawtimber	14,227	569	30,716	35,324	5,485	0	5,485
	34,982	2,229	128,402	147,662	22,929	156	23,085
Administrative							
Working Group							
Virgin Saw-	366	29	1,376	1,582	246	3	249
timber							
Cutover							
Sawtimber	526	21	1,311	1,508	233	4	237
	892	50	2,687	3,090	479	7	486
Subtotal							
Operable	35,874	2,279	131,089	150,752	23,408	163	23,571
*Inoperable							
Sawtimber	7,833	314	36,666	42,166	7,530	58	7,588
Total							
Commercial	43,707	2,593	167,755	192,918	30,938	221	31,159

*The 7,833 acres of inoperable lands occur primarily in the general boxing of all main drainages at their lower end. In these areas, rock, steep slopes, and sheer drops make logging economically infeasible under present conditions.

3. Other Forest Lands, National Forest Only

Table 3.

Land Class or Condition Class	Acres	Sawtimber			Pole timber 5-8"	Total
		12"+	9"+	9"+		
		Scribner	Int. $\frac{1}{4}$ "	M Cu.Ft.	M Cu.Ft.	M Cu.Ft.
		Mbf Net Volumes			Net Volumes	
*Woodland	86,671	—	—	1,056	73,560	74,616
Nontimbered	24,444	—	—	—	—	—
Total	111,115	—	—	1,056	73,560	74,616
Working Circle						
Total	154,822	167,755	192,918	31,994	73,781	105,775

*Estimated cubic-foot volumes for woodland type are given to show the potential for harvesting substantial amounts of convertible products and other products from those lands.

4. Commercial Operable Forest Lands by Forest Types

Table 4.

Forest Type	Acres	Scribner	Int. $\frac{1}{4}$ "	M Cu.Ft.
		← Mbf Net Volumes →		Net Volumes
Ponderosa Pine	35,474	129,790	149,259	23,339
Mixed-Conifer	400	1,299	1,493	232
Totals	35,874	131,089	150,752	23,571

C. Growth1. Periodic Annual Increment

Table 5.*

Forest Type	Total per Type			Weighted per Acre Averages		
	M Bd.Ft. Net		Net	Bd. Ft. Net		Net
	Scribner	Int. $\frac{1}{4}$ "	M Cu.Ft.	Scribner	Int. $\frac{1}{4}$ "	Cu.Ft.
Ponderosa Pine	1,770	2,035	316	49.9	57.4	8.91
Mixed-Conifer	32	37	6	80.1	92.1	14.30
Working Circle						
Totals	1,802	2,072	322	50.2	57.7	8.96

*Data in this table based on present basal area stocking.

2. Potential Mean Annual Increment

Table 6.

Forest Type	Total per Type			Weighted per Acre Averages		
	M Bd.Ft. Net		Net M Cu.Ft.	Bd. Ft. Net		Net Cu.Ft.
	Scribner	Int. $\frac{1}{4}$ "		Scribner	Int. $\frac{1}{4}$ "	
Ponderosa Pine	5,234	6,019	935	147.5	169.6	26.34
Mixed-Conifer	70	81	12	175.2	201.5	31.29
Working Circle						
Totals	5,304	6,100	947	147.9	170.1	26.41

D. Regulation

	<u>Technical</u> <u>Working Group</u>	<u>Administrative</u> <u>Working Group</u>
1. Control	Area with volume checks	Area with Volume checks
2. Cutting Period	20 Years	20 Years
3. Rotation Age	110 Years	190 Years
4. Rotation Period	120 Years	200 Years

E. Allowable Cut and Cutting Limitations

1. Available annual cut for this period, F.Y. 1963 through F.Y. 1972.

Table 7.

Allowable Annual Cut - Sawtimber Size

Kind of Cut	Acres	Average No. of Compartments	M Bd. Ft. Net		M Cu.Ft. Net
			Scribner Rule	Int. $\frac{1}{4}$ " Rule	
Regeneration (Harvest)	140	—	470	540	83.93
Intermediate	1,654	2	1,330	1,530	237.50
Total	1,794	2	1,800	2,070	321.43
Total 10-year allowable Cut			18,000	20,700	3,214.30

Table 8.

Allowable Annual Cut - Other Products

Kind of Cut	Kind of Product						Total		
	Pulpwood			Poletimber			Acres	Cu.Ft.	Cords
	Acres	Cu.Ft.	Cords	Acres	Cu.Ft.	Cords			
Regeneration (Harvest)	15	465	3	15	71	1	30	536	4
Intermediate	605	18,755	147	533	3,129	24	1,138	21,884	171
Total	620	19,220	150	548	3,200	25	1,168	22,420	175
Total 10-Year Allowable Cut	6,200	192,200	1,500	5,480	32,000	250	11,680	224,200	1,750

2. Cutting Limitations

This plan recognizes that varying market conditions tend to dictate annual cuts of timber. The annual available cut should be a guide for cutting and this cutting on the working circle should be scheduled annually. Actual cutting will be balanced with the allowable cut over the 10-year-plan period. No limitation on yearly undercuts is established. Undercuts may be made up any time during the cutting period. Total Overcutting for the 10 years covered by this plan may not exceed 10% of the allowable cut.

F. Plan Revision

This plan will be revised prior to June 30, 1972. Revisions, additions, or amendments before this date will be made as necessary because of changes or advances in utilization of products, the occurrence of extensive burns, insect epidemic, or other conditions which the Forest Supervisor shall deem necessary to make this plan inoperable. The Forest Supervisor will have authority to make changes in the cutting budget, the transportation planning, the schedule of compartment examination and compartment entry. The Action Plan Section of this management plan, including Sections VI, VII, VIII, and maps, will be revised annually as needed by the Forest Supervisor for approval by the Regional Forester.

G. Coordination With Other Uses.

The Jicarilla District Multiple Use Plan sets the guidelines for coordinating the use of the timber resource with the use of other resources. This plan makes reference to the need for special treatment of areas classified for other uses and establishes a separate working group for recreation areas, roadside zones, etc. This plan prescribes the management for these areas to attain the objectives stated in the Multiple Use Plan.

III. INTRODUCTION

A. Description of Working Circle

The Jicarilla Working Circle of the Carson National Forest is located in the northwestern section of New Mexico. It is bounded on the north by the Colorado State line, on the east and south by the Jicarilla Apache Indian Reservation, and on the west by other government-owned land. The west boundary is generally along the line between timbered and non-timbered lands. The working circle contains only the Jicarilla Ranger District. It is geographically separated from the rest of the Carson National Forest and lies entirely within the San Juan Basin. Drainages cut through the working circle from east to west. They run from the Continental Divide, located some 30 miles to the east, to the San Juan River, which skirts the working circle on the north.

The soils of the entire area are sedimentary with sandstone predominating. Soils are derived from the Wasatch, Torreon, and Puerco formations which intermingle with the Ojo Alamo Sandstone. The Wasatch is probably the principal formation exposed. The type of geologic materials in this formation often produces "sugar-soils"--ones which, under the action of water, melt like sugar.

At present, nearly every degree of erosion can be found on the slopes, ridges, and mesas in varying stages. Soil stabilization is of paramount importance over the entire working circle. Timber harvesting methods will be designed to meet the needs of halting the current tremendous amount of soil loss.

Elevations range from 6,200 to 7,900 feet. A series of deep drainages run across the working circle from east to west. A series of small tributaries run into these deeper drainages. The sides of the main canyons tend to be quite precipitous toward the west side of the working circle. Rolling mesas occur between the main canyons. The woodland type predominates in the rougher country to the west. The only live stream is the San Juan River, which barely touches the extreme north edge of the working circle.

Over large areas the soil is too shallow to support commercial timber species. On these areas pinyon and juniper predominate. On areas of more favorable slope and soil, ponderosa pine is found. This type includes areas of defective stems near the edges of the forest type, and areas of high volumes per acre of excellent stems on better sites. These are in pockets which vary from a few acres to several sections. Mixed-conifer stands, consisting of ponderosa pine and Douglas-fir, are scattered throughout the working circle in canyon stringers. This type is generally economically inoperable at this time.

Three major vegetative types occur. They are so intermingled in many areas that it is nearly impossible to separate them. Generally, the ponderosa pine type occurs in the uplands, pinyon-juniper woodland

on the mesas and slopes of the lower elevations, and sagebrush grasslands in the canyon bottoms and in isolated parks scattered throughout the other major types. Stringers and pockets of the mixed-conifer type are found on the north-facing slopes.

The climate of the working circle is characterized by wet summers and winters. However, both snowfall and rainfall are quite erratic. It normally becomes extremely dry in the spring and fall. Average annual precipitation varies from approximately 11 inches in the lower elevations to 17 inches in the higher elevations. The greatest portion of the working circle lies in the 12- to 15-inch precipitation belt. About two-thirds of the total precipitation is in the form of snow. The entire area is subject to jet-stream winds in the spring, causing high and rapid evaporation.

B. Description of Timber

1. Ponderosa Pine

This type comprises 98% of the commercial areas and volume of the working circle. The condition of pine stands varies considerably. In the 1930's the best areas were cut heavily. An estimated 80% of the volume was taken. Generally, these stands are considered understocked now. Areas cut over later are generally in better condition, although these too are severely short of the smaller size trees.

This type begins at 6,500 feet on the north and the east exposures, and at 7,000 feet on the south and the west exposures. On the north and the east slopes of deep canyons, this type merges with the mixed-conifer type. The spread in elevation over the working circle is about 1,300 feet; thus, the mixing of the forest types is general throughout the working circle. As a general condition, this type is understocked. Regeneration is hampered by dense stands of oak brush.

2. Mixed-Conifer

This type supplies the remaining 2% of the commercial timbered area of the working circle. Species in the type are ponderosa pine, Douglas-fir, and noncommercial species such as pinyon pine and juniper. For practical purposes this type is entirely virgin. The various age classes are represented in this type, although individual areas lack adequate stands of one or more age classes.

The mixed-conifer type is found only in the canyon bottoms and on the lower north slopes of deep canyons between 7,000 to 7,800 feet elevation. This type generally merges with the pine type, although it joins the pinyon-juniper woodland type in some places. Usually it is inoperable for logging throughout the working circle as it occurs in steep, rocky areas.

3. Aspen

There are no areas of aspen which are large enough to be typed as aspen stands. A few small aspen stems are found with the ponderosa pine stands, but they are not present in commercial quantity or quality.

4. Woodland Brush

The woodland-brush type is the largest management area. It extends through the entire length of the working circle and across the entire width in several places in the northern half of the working circle. Pinyon pine and juniper trees are the prevalent cover. There is a browse understory. Fringe ponderosa pine stands and sagebrush-grassland parks are scattered throughout.

C. History of the Working Circle

The Taos Forest Reserve was withdrawn for Forest Reserve purposes on November 7, 1906, by Presidential Proclamation. On July 1, 1908, the Carson National Forest was created by consolidating the Taos Forest Reserve and a portion of the Jemez Forest Reserve. A large part of the Jicarilla Apache Indian Reservation was placed under Forest Service control by proclamation of March 2, 1909. To this was added the greater portion of the Jicarilla District of the Carson National Forest by the proclamation of August 24, 1910. On February 17, 1912, by Executive Order, all of the land originally included within the Indian Reservation was eliminated from the Forest. Thus, the Forest Service retained a narrow strip approximately 6 miles wide and 35 miles long, extending north and south. This is the present area of the working circle.

In the late 1800's the area received severe grazing by cattle and sheep. This started most of the extreme erosion problems the area now has. The enactment of the Homestead Act caused an influx of farmers and ranchers between 1912 and 1923. Most of the private land is in scattered bottomland tracts in the central and northern portions of the working circle. There are no dependent communities within the working circle, or immediately adjacent.

At present, there are 103 miles of pipelines and 226 miles of gas-well access roads under special-use permits to gas companies alone. The working circle is virtually honeycombed with these roads.

No extensive timber cutting was done on the working circle until 1936. Since that time about 27 million board feet have been removed, all under Forest Service supervision.

The working circle was covered by the plan for the Chama Working Circle which was established in 1935. That plan called for a 60-year cycle with a 67% removal of timber on the Jicarilla block, and was based on natural regeneration. The length of rotation was considered of minor importance. A technical rotation of 150 years was established.

The annual allowable cut was estimated at 1,066 M bd. ft. for the Jicarilla Block. The total volume was 95,000 M bd. ft. and the available volume was 63,000 M bd. ft. Only the Laguna Seca and the Carracas Mesa areas were considered as operable at that time. Estimated removals were 14,656 M bd. ft. from Laguna Seca and 49,298 M bd. ft. from Carracas Mesa.

Despite the absence of adequate survey figures, actual cutting compares favorably with planned cutting. In the first 28 years of the proposed 60-year cycle, approximately 27 million feet have been removed from roughly one-half of the commercial area. However, 5,850 M bd. ft. of this was cut in 1961-62 in the Mestenas Mesa area. This area was considered inoperable in the 1935 plan.

Table 9.

Comparison of First Plan, 1935, with Present Plan, F.Y. 1963

	<u>1935</u>	<u>1963</u>
Net Volume, MM bd. ft., Commercial Forest Lands	94.8	167.8
Volume/Acre	?	3,839 bd. ft.
Annual Allowable Cut MM bd. ft.	1.0	1.8
Rotation Years	150	120
Cutting Period	60	20

Net volume difference between the 1935 plan and the 1963 plan results from closer typing and a more intensive inventory of the working circle for the 1963 plan. The higher annual allowable cut in 1963 results from the increased acreage in part.

D. Past Accomplishments

1. Volume and Area CutOver

The only previous calculations for an annual allowable cut for the working circle are in the 1935 Chama Working Circle plan. In that plan the allowable annual cut was calculated at 1.0 million bd. ft. The total volume cut on the working circle since cutting began in 1936 is 27,516 M bd. ft. on 14,753 acres, or roughly 45% of the total commercial acreage of the working circle. This volume amounts to an annual average cut of about one million bd. ft.

2. Timber Stand Improvement

Little has been done in timber stand improvement work on the working circle in the past. On Carracas Mesa, 15,730 trees on 1,225 acres were pruned in the period 1950-57. Poor sites coupled with lack of regeneration on most areas have made timber stand improvement infeasible under past timber management policies and financing.

3. Fire Control

Past fires on the working circle have been small. They have caused no major problems in erosion or stand regeneration. The largest recorded fire on the working circle burned 35 acres in 1950. Annual burned average of acres is 4.4 acres.

Intensive law enforcement during the dry hunting season of 1959 resulted in convictions for 99 man-caused fires. Normally, however, lightning is the major cause of fires on the working circle and the incidence of a man-caused fire during the extreme fire season is low.

The highly combustible fuels on the working circle of the north-south divide are a serious fire hazard. Fire management programs, especially logging prescriptions will be developed and used as part of all forest management activities for the working circle.

The nearest railroad is at Tule, a distance of about 20 miles from the working circle. The nearest saw and planing mills are at Tule, Tule River, and at Eugene Springs, District, each of which are on the railroad. The nearest logical market point is at Eugene, the largest available market for the working circle's products is Eugene Springs, Tule River, Tule, Tule River, and Tule, the District.

4. Forest Management

The immediate objective in the management of the working circle stands on the working circle will be the removal of future mortality and the early removal of the deadwood damage of the stand. Therefore, an immediate goal in the working circle, it will be necessary to carry out a program of the working circle to remove the deadwood damage of the working circle.

5. Forest Management

One objective of the working circle will be the removal of future mortality and the early removal of the deadwood damage of the stand. Therefore, an immediate goal in the working circle, it will be necessary to carry out a program of the working circle to remove the deadwood damage of the working circle.

In anticipation of a considerable increase in the working circle, a program will be developed to remove the deadwood damage of the stand. Therefore, an immediate goal in the working circle, it will be necessary to carry out a program of the working circle to remove the deadwood damage of the working circle.

There will be extensive removal of deadwood damage of the stand. Therefore, an immediate goal in the working circle, it will be necessary to carry out a program of the working circle to remove the deadwood damage of the working circle.

IV. PROBLEMS

A. Timber Harvest

Because of the precipitous nature of the topography and the boxing of the canyons on the west side of the working circle, it is often necessary to reverse the usual logging procedure and move the timber uphill to the east. Normally, the timber must be harvested by working off the mesas and down the drainages to the point where they box and become impassable.

Generally, volumes are low, averaging about 4,000 feet per acre in the virgin stands. Reproduction is sparse, particularly on the west and the south exposures. The first sawtimber cut of the area has improved the spacing of stands and released the better individual trees. However, it will be difficult to provide a continuous sawtimber harvest until adequate reproduction can be assured on all planned regeneration areas.

The highly erodible soils on the entire working circle merit special consideration in the timber harvest. From compartment examinations, special logging prescriptions will be developed and made a part of all timber sale contracts for the working circle.

The nearest railhead is at Dulce, a distance varying from 20 to 40 miles from the working circle. The nearest saw and planing mills are at Chama, New Mexico, and at Pagosa Springs, Colorado, both of which are on the railroad. The nearest logical market point is at Dulce, New Mexico. The largest sawmills adjacent to the working circle are located at Pagosa Springs, Colorado; Chama, New Mexico; and Gallina, New Mexico.

B. Timber Utilization

The immediate objective in the harvest of the remaining virgin stands on the working circle must be the capture of future mortality by the early removal of the decadent elements of the stand. Therefore, in the initial cut in the virgin stands, it will be necessary to vary the volume of the cut considerably by areas so as to fit the needs of the individual stands.

C. Recreation Use

Past recreation use has been low on the working circle because of the general shortage of water throughout the area and the distance from population centers.

In anticipation of a tremendous increase in this use, timber management must be intensified in all camp and picnic areas, along scenic strips, and in organizational buffer zones.

There will be intensive cleanup of slash on these areas. Harvesting will be done at a time when recreation activities are at low ebb. On all recreation areas, the objective will be to protect, improve, and maintain stands of timber which will be adequate for the recreation uses in those areas.

The increase in recreation use and the corresponding increase in the value of lands suitable for recreation use will continue to have an impact on the type of management which can be practiced.

D. Gas and Oil Conflicts

Special land use, such as powerlines, pipelines, well location clearings, and road rights-of-way, will continue to remove land from timber production. At present, over 330 miles of gas pipelines and road rights-of-way are under special-use permit on the working circle. As the natural gas in the area is exploited, an appreciable amount of timber is harvested annually as land is cleared. All possible efforts must be made to divert pipelines and roads to sites of lower timber producing capabilities.

E. Deer

This area produces deer browse in considerable quantities. This makes it a concentration area for one of the largest deerherds in the state. A high percentage of the area receives year-long use. So long as this deer concentration continues in the working circle, the deer can hinder the establishment of reproduction. Abuse of the browse species is already noted. The deer population must be reduced to a reasonable level in future regeneration areas through special hunts or other means.

F. Cattle

At present, cattle use is light in the commercial timber areas. Improvement cutting and thinning could produce conditions which are favorable for growing more cattle forage.

Even-aged management of timber with large regeneration areas offers the best opportunity for maximum use of much of the forage resource. Cattle use could become an important consideration. Cattle should be excluded from the regeneration areas through salting practices, fencing of waters, or enclosure fences. It is also possible to handle the grazing by temporary reduction in numbers of livestock, or other means as determined to be practical and effective.

Specific regeneration areas will be delineated in the presale prescription in all cases.

G. Fire

Intensive presuppression and suppression measures, although adequate in the past, must be continually improved. Costs of controlling large fires and of rehabilitating burned areas are constantly increasing and these costs plus the loss of the basic resource indicate that we cannot afford to have large fires. Funds spent for hazard reduction, brush disposal, thinning programs, and fire prevention undoubtedly will pay dividends up to a point which will be determined administratively.

Slash disposal will consist of cleanup of roadside zones where fires are likely to start and cleanup in planned fire-breaks by piling and burning. Special attention will be given to the use of slash to plug skid trails, to retard further soil cutting in gullies running through deep soil flats, and to prevent sheet erosion on highly erodible areas with little or no vegetative cover. Slash disposal practices will be coordinated with hazard reduction and thinning operations. Slash will be treated so as to aid in control of endemic insect populations.

More intensive law enforcement measures will be developed and enforced to provide optimum fire protection of all timbered areas, particularly during periods of heavy recreation and hunting use.

H. Erosion Areas

There are no designated watershed areas or projects on the working circle. However, soils on the entire area are highly erodible and deep gully-cutting is excessive. Soil protection and maintenance of adequate ground cover must receive consideration in the management of the timber resource. The entire circle drains into the San Juan River or its tributaries. The newly completed Navajo Dam lies just west of the northwest portion of the working circle. Proximity to this storage project dictates that all possible erosion control measures be exercised in the resource management of the area.

It has long been recognized that fluctuations in stream flow are related to timber cutting practices in the forest. It is also known that sedimentation in streams is related to the removal of vegetative cover. The timber manager must use any information and techniques that will aid him to weld the practice of the forest management with that of good watershed management.

Logging damage must be minimized by proper location of skid trails and roads. Specific areas will be mapped in compartment examination where logging should be modified to protect the watershed where soil type, topography, etc., are critical. Sales will receive supervision so that protection is given to the water resource.

Vegetative cover of browse and grass species will be renewed on all but timber-regenerated areas. Check dams will be built and other engineered erosion-control measures will be applied. Erosion-control-problem areas will be mapped and erosion-control treatment will be prescribed at the time of presale prescription or compartment examination.

Soil disturbance necessary for the regeneration of trees on timber production land is considered justified by the expected increased benefit from the resulting timber stand. This disturbance must be done in a manner that will assure soil retention.

On devastated areas, burns, etc., vegetative competition to tree reproduction will be eliminated or reduced either by removal in strips on the contour, or by removal on larger areas where the disturbed soil will be terraced.

I. Land-Use Conflicts

Approximately 100 acres of commercial forest type lies within the Bureau of Reclamation withdrawn area in connection with Navajo Dam. No conflict with timber management is anticipated as a result of the withdrawal. However, the 1972 revision of this plan should consider all withdrawals as they relate to increased recreational use as a result of the Dam.

J. Regeneration

Dense patches of oak brush are found throughout the ponderosa pine area. The oak presents a definite silvicultural problem as it tends to spread and develop rapidly at the expense of pine reproduction when openings occur in the stand. On the better sites the oak grows 8 to 10 feet high and tends to make a closed canopy when in full leaf. It is held in check only in the better stands of pine by the overstory, but is always present, even in the heaviest stands. Following cutting it spreads and develops rapidly. Practically no desirable reproduction can be found under the brush. Methods of oak control must be developed to insure natural and artificial regeneration. Site preparation and animal control must be considered for all planned regeneration areas. Regeneration must be accomplished during this plan period.

V. MANAGEMENT PRESCRIPTION

A. Silvicultural System

1. Technical Working Group

The even-aged system of management is adopted for the Jicarilla Working Circle. The Technical Working Group is the major working group. Regulation will be by area for each of the two recognized working groups.

a. Mixed-Conifer Type

Cutting Period	20 Years
Rotation Period	120 Years
Rotation Age	110 Years
No. of Age Classes	6
Total Area	352 Acres
Regeneration Area Each Cutting Period	59 Acres

All of this type occurs as virgin sawtimber. There is enough advanced reproduction to supply the regeneration needed in this cutting period. The type appears to be an ecological accident, as Douglas-fir mixes with pinyon-juniper on dry sites on many areas.

b. Ponderosa Pine Type

Cutting Period	20 Years
Rotation Period	120 Years
Rotation Age	110 Years
No. of Age Classes	6
Total Area	34,630 Acres
Regeneration Area Each Cutting Period	5,772 Acres
Regeneration Area Annually	289 Acres
Regeneration Area This Cutting Period	2,641 Acres*
Regeneration Area Annually This Cutting Period	132 Acres*

* 3,131 acres deforested land to be planted this cutting period.

2. Administrative Working Group

The Administrative Working Group includes all administrative sites, planned recreational areas, and roadside zones on the working circle. There are 892 acres in this group. Cutting will be by group selection and individual tree selection in forest camps and picnic grounds.

The cutting period, for the purpose of organization, is established at 20 years. Intermediate removals may be made as necessary to salvage mortality until the desired distribution of age classes is present.

Where necessary, regeneration by planting or direct seeding will be done to secure the stocking needed for recreation purposes.

Insofar as possible, commercial sales will be used to cut the timber in this working group.

Cutting Period	20 Years
Rotation Period	200 Years
Rotation Age	190 Years
No. of Age Classes	10
Total Area	892 Acres
Regeneration Area Each Cutting Period	89 Acres
Regeneration Area Annually	4.5 Acres

Junipers, pinyon pine, and hardwoods will be exceptions to rotation planning.

B. Rotations

A technical rotation of 110 years is selected in the Technical Working Group with a rotation of 190 years for the Administrative Working Group, in lieu of the 150-year rotation of the 1935 plan. Available information indicates that 110 years is approximately the age of culmination of mean annual increment of the stand.

C. Methods of Cutting

These are grouped broadly into two main classes--intermediate cutting and reproduction cutting.

1. Intermediate Cuts

These may include any one or more of the following at each time of entry.

a. Initial Cut in Virgin Stands

This cut is a combination of the other intermediate cuts. Its purpose is quick removal of trees that are not expected to live until a reproduction cut or subsequent intermediate cut is made.

b. Sanitation Cut

This cut is made to remove trees infected with disease or infested by insects.

c. Risk Cut

This cut is made to remove trees likely to die before the next periodic cut.

d. Improvement Cut

This cut is made to remove trees of poor form and/or poor genetic qualities.

e. Thinning Cut

This cut is made to improve growth rate in the residual stand by reducing the stands to their optimum basal area.

f. Salvage Cut

This cut is made to remove merchantable dead or dying trees. Salvage cuts will be made as often as necessary to use this material.

2. Reproduction Cuts

Reproduction will be established naturally, if possible. If a seed crop is not evident, direct seeding may be done underneath the seed tree cover.

a. Seed Cut (Reproduction Cut)

This cut will be made to reduce the stand to the number of seed trees which are needed to provide seed for reproducing the area. This cut also provides the openings where reproduction may be started. During this cut the site will be prepared to receive the seed.

b. Removal Cut

When adequate reproduction above browse height has been established, the seed trees will be removed. If reproduction cannot be established from seed, the seed trees will be removed and the stand will be established by planting. Where adequate advance reproduction exists, the seed cut will be by-passed and all of the overstory removed in the removal cut.

D. Stand Priorities

Priorities will be established for cutting areas or stands. Stands killed or badly damaged by insects, disease, fire, or wind will be cut first. Adjustments will be made in the cutting schedule to make possible the immediate harvesting of these areas whenever necessary. Otherwise, stands over rotation age will be cut first. Approximately 50% of the timber is in virgin, near-stagnated stands. These must be replaced by young, even-aged stands for the maximum production of wood.

E. Special Treatments - Recreation Areas

These areas will be managed as a part of the Administrative Working Group. Planners of the Division of Timber Management and Recreation and Lands Management will jointly prepare an action plan to provide replacement trees for recreation-use areas. Eighty years of optimum growth will be needed to culture trees to a size desirable for recreation purposes. Therefore, the plan will be made from an inventory which identifies those trees which will need to be replaced during the next four cutting periods.

All trees above the 120-year age class will be so identified, in addition to safety-hazard trees and sanitation and risk trees. Trees below the 120-year age-class can be considered as replacement if they are healthy and are either free to grow, or can be released. The plan will make provisions for thinning, pruning, and planting to culture desirable replacements. Pruning will often require special criteria and techniques. Pruning for stand sanitation will be done as required to maintain a healthy, productive stand. Other pruning should be done on a plan-wide basis in order to attain a variety of views, or for other purposes of recreation and timber resource management.

Stands on potential sites or areas designated for recreation but not yet developed should be treated by commercial sales at the earliest opportunity. The desired stand-age at time of development for recreation should be 120 years and younger, with distribution through the younger age-classes. Therefore, new recreational developments should be made in stands 120 years of age and younger. If at all possible, stands will be cut through commercial sale procedures prior to recreational development. Trees over 120 years old may be retained if they are healthy or if their retention is desirable to improve the overall aesthetics of the area.

Area regulation is the desirable management system to use on stands on lands designated for near-natural recreation management, such as buffer zones, roadside zones, and water-front zones, where cutting is permitted. The objective will be to maintain a normal distribution of age classes. The optimum situation would be to have one-tenth of such recreational land in each of the 20-year-age classes, using a 200-year rotation and 20-year cutting period. This will require timber-type classification of the stands by age classes. Once the type and area by age classes are known, management should be aimed toward making up any deficiencies in the age classes. At the same time, each stand should be treated according to its silvicultural needs. Silvicultural treatments will be:

1. Artificial regeneration where necessary to complete the stocking needed for recreation purposes.

2. Thinning to culture younger age-class trees into large-size trees. Thinning to open up the roadside screen and give depth to the view under crowns of existing trees.

3. Removal of safety-hazard trees, and sanitation and risk trees.

4. Harvest-cut, either singly or in groups, trees that are over rotation age. This will release younger stands, create openings of a fraction of an acre where regeneration is needed, and will provide for orderly replacement by younger age classes.

Treatments 2, 3, and 4 should be done in the nonrecreational season. Cutting methods shall be spelled out in all presale reports.

The remaining forested lands not specifically designated for recreation purposes receive more recreation visits than any other for purposes of hunting, enjoying forest environment, and other reasons. All presale prescriptions should consider aesthetics such as the arrangement of regeneration areas, the protection of meadows, the reduction of roadside logging slash and debris, and similar practices.

F. Precommercial Cleaning and Noncommercial Thinning and Release Cutting

At this time there are only a few stands on the working circle in need of thinning. The marked shortage of stands with lower diameter classes limits the need for this treatment. There are areas on Carracas Mesa and Laguna Seca where some treatment is needed, however, and it is anticipated that there will be considerable need for this program in the future. This condition likewise applies to commercial thinning and pulpwood cutting. This program will be planned as needed.

G. Cutting of Other Products

Cutting of other wood products is of significant importance on the working circle, primarily in the woodland type.

Harvesting pinyon Christmas trees from the woodland type has been successful in the past. This should continue to be encouraged, particularly in areas of woodland encroachment into commercial timber stands. Because of the scarcity of reproduction on the working circle and the limited amount of the mixed-conifer type, Christmas tree harvesting will be confined to the pinyon-juniper woodland type at this time.

There are extensive virgin areas of juniper that have a high value for fence posts and other products for local use. Little importance has been attached to these areas in the past and, in most cases, they remain relatively untouched. As new information is gathered and improved methods are learned in wood utilization, these woodland types will be utilized to their full extent. For this plan, however, these species will be discouraged from encroaching into natural openings.

About 80% of the working circle acreage is composed of this woodland type. Therefore, the importance of wood products to be harvested from it will be given careful consideration from all standpoints of multiple use management.

ACTION PLAN

1963 TIMBER MANAGEMENT PLAN

Jicarilla Working Circle

Carson National Forest

Sections VI, VII, VIII, and Maps

REVIEW AND REVISION CONTROL SCHEDULE

Fiscal Year	Forest Supervisor						Regional Forester	
	Reviewed by:		Revised by:		No Revision Needed:		Approved by:	
	Name	Date	Name	Date	Name	Date	Name	Date
1963	Working Circle Plan Prepared By Ted S. Koenig, April 17, 1963							
1964								
1965								
1966								
1967								
1968								
1969								
1970								
1971								
1972								

Revised Working Circle Plan Prepared By _____ Date _____

VI. MANAGEMENT CONTROLS

A. Inventories

This plan is based on an extensive timber inventory completed in 1957, using 103 randomly located $\frac{1}{4}$ -acre plots. Fifteen plots, falling in fringe or woodland types, were not included in the calculations shown in this plan. Sixteen plots, located in cutover stands, were established permanently. The remaining 72, occurring in virgin stands, will be permanently established upon reinventory in 1967.

The standard error of the estimate is computed to be $\pm 7.6\%$. No additional plots will be established. Upon reinventory all existing plots will be brought to current regional standards.

B. Compartment Examination

The working circle has been divided into 113 compartments over the gross 158,706 acres for an average of about 1,400 acres per compartment. Examinations of these compartments, with detailed prescriptions, is of the highest priority and will be completed prior to June 30, 1973. An examination schedule by compartments and years is made a part of this plan (Appendix). This schedule is correlated with the cutting budget where possible. Because of the large number of woodland compartments, necessary adjustments in this schedule can be made easily, dependent upon future priorities which may occur as these woodland areas are developed.

In proposed timber sale areas, all compartments will be examined and the silvicultural prescription prepared approximately two years prior to the sale. Regional guides will be followed in the examination of these compartments and in the writing of the individual prescriptions.

A compartment folder will be maintained which will have pertinent information on site indexes, stand sizes and ages, and yields from the methods of cutting, logging methods, transportation layouts, and other records and plans.

Number of compartment examinations per year for completion of the working circle during the period 1963-72 at an average of 1,400 acres per compartment follows:

1963 - 4	1968 - 13
1964 - 9	1969 - 12
1965 - 13	1970 - 12
1966 - 13	1971 - 12
1967 - 13	1972 - 13

C. Regeneration Controls

Regeneration is a problem which must be successfully dealt with on the working circle during this cutting period. Knowledge about regeneration is available.

Effort during the next five years will be to successfully apply this knowledge and to develop techniques that will enable us to reforest our stands satisfactorily and economically.

1. Natural Regeneration

Probably there will be some problems to overcome to get desired stocking following regeneration cutting. Only on north and east slopes have the pine reproduced in numbers that approach adequate stocking levels. The administrator must, therefore, take advantage of all measures possible to insure a maximum degree of success by this means.

Oak brush, one of the major factors affecting natural regeneration in the pine type, has previously been covered in Section IV. Other major factors affecting regeneration are seed source, site conditions, climate, cutting practices, and protection. We can control all these factors except climate and we can manipulate certain factors such as vegetation to take advantage of the favorable aspects of climate. The administrator is urged to study the history of past weather and its cyclic trends with a view to establishing favorable conditions for success of newly germinated seedlings.

Site preparation, rodent control, insect control, and animal control should all be considered in the regeneration effort and all possible measures taken to produce favorable results.

Three to five seed trees per acre will be kept in regeneration cut. These seed trees will be cut after reproduction becomes well established. Site preparation to include removal and destruction of competing vegetation in strips along contours should be used to aid establishment of seedlings. Experience has shown that germination and survival are better when ponderosa pine seeds are in contact with mineral soil. Partial shade favors germination, but later effects, on the whole, are detrimental to seedlings. Survival and growth are greatly enhanced by removal of competing vegetation.

2. Artificial Regeneration

a. Degree of Stocking

Experience indicates that through proper planting techniques, including site preparation and control of rodents and other animals, we might expect to get 60 to 70 percent survival of nursery seedlings. By planting 875 seedlings to the acre, roughly a 7 by 7 foot spacing, we can expect to get survival of about 600 seedlings. At 2" d.b.h., 600 trees occupy about 18 percent of the site.

b. Site Preparation

Site preparation will be needed to reduce and eliminate competing vegetation prior to planting. This is essential for satisfactory seedling survival and growth of ponderosa pine. Site preparation

will be necessary before direct-seeding ponderosa pine to enable the seed to make contact with mineral soil.

c. Direct Seeding

Direct seeding in the Region has proven successful in areas comparable to this working circle and this method will be used to obtain artificial regeneration.

The required amount of seed is not static. It is known that in nature regeneration usually occurs by saturation of an area with seed. It is economically impossible to duplicate nature. However, through reduction of seed predators, site preparation and proper seed placement, we can obtain good results with a greatly reduced amount of seed.

Efforts will be made to locate and record trees and areas of high seed-producing capabilities. Good cone crops normally occur only about every three to five years and collection of local seed must be correlated with seed production.

D. Calculation of Planned Cut

The method of control used in all cutting done will be area regulation. Present calculations for available annual cut are considered to be as accurate as present information allows, but are intended only as a guide to provide a basis for planning. At the end of a five-year period, experience data can be used for adjustment and application to a future cutting budget. The sawtimber size allowable annual cut is set at the periodic annual increment. Allowable cut for other products is in addition to this cut. See the Appendix for details of calculation of the allowable annual cut.

E. Records

Records will be kept by compartments in accordance with Regional instructions.

F. Cutting Budget

1. Planned Sales through F.Y. 1972

The following schedule of sales through F.Y. 1972 has been established:

Table 10.

Map No.	Name of Sale	Size MM Bd.Ft., Scribner	F.Y. to Cut
1	Pueblita	0.40	1963
2	Dry Lake	10.00	1963-1965
3	Carracas	15.84	1969-

The sale units are shown on the Cutting Plan Map in the Appendix.

2. Budget of Entry

A budget of entry based on regulation by area control will be prepared to replace the cutting budget as compartment examinations are made.

VII. TIMBER DISPOSAL POLICIES

A. Sales

Sales will be made with the objective of harvesting the allowable cut of the working circle by 10-year periods. Because there are no communities within commuting distance of the working circle, it might be necessary for operators to construct logging camps. Offerings will be made in units of such size as to fit the needs of the small and medium-sized mills typical of the industry of this Region. The sales should be of sufficient size to bear the increased camp costs.

Control will be by compartments and cutting will proceed on a compartment release basis.

Large or long-term sales are not anticipated. Contract periods will rarely exceed three years and will be shorter in most cases.

B. Point of Manufacture

Nearest existing points of manufacture are at Chama, New Mexico; Pagosa Springs, Colorado; and Gallina, New Mexico. Chama, 50 miles away, is nearest.

C. Utilization Standards

The requirements contained in FSH 2400 and in the standard contract clauses with respect to utilization and merchantability standards are satisfactory to provide needed protection for the forest's resources.

D. Logging Methods

Logging practices specified by the Manual and Handbook will be required in all sales, regardless of size. These include logging practice, road specifications, slash disposal, and timber stand improvement provisions. No special policies with respect to these items are required for the working circle.

E. Erosion Control

Supervision of all logging operations within the working circle, regardless of size or nature, will provide for definite and strict controls of erosion prevention measures. These will include special provisions and requirements not adequately covered in the standard sale contract clauses if compartment examinations of the area involved so indicate.

They will show areas that should not be logged because of the danger to watersheds because of soil types, topography, or other factors. Data that will aid in working out remedial measures where previous erosion damage has occurred will be used in the preparation of sale specifications.

VIII. FOREST DEVELOPMENT

A. Transportation

In the past ten years many roads have been constructed as a part of the development of the natural gas and oil resources. The present network virtually spiderwebs the working circle and new spur roads are constantly being built in conjunction with this use. No special problems are anticipated in using these roads for timber harvesting.

Table 11 lists the road program which is important to the 20-year harvesting program. As the sales program is extended and amended, the transportation plan will be so modified. Details of the overall long-range road construction and reconstruction program for the Carson National Forest may be found in the Twelve-Year Road and Trail Program Report. No rights-of-way are needed to carry on the 20-year harvesting program.

Table 11.

Transportation Plan for Timber Harvest

Map No.	Sale	Road No.	Road Name	Year Work To Start	F.S. Road Stand-ard	Miles to be Con-struct.	New and Recon-struct.	Approximate Cost
2	Dry Lake	2314	Pueblita	1963	SL12	6.9	R	10,350*
2	Dry Lake	2315	Munoz	1964	SL12	1.0	R	1,500*
2	Dry Lake	2311	Cedar Spr.	1964	SL14	1.5	R	2,750*
3	Carracas	2218	Carracas M.	1968	SL14	12.0	R	6,000*
3	Carracas	2310	American M.	1974	SL14	3.0	R	1,500*

*To be built by operator.

B. Reforestation

Present pine stands vary from a few well-stocked stands on Carracas Mesa to greatly understocked stands in the Mestenas Mesa and Laguna Seca areas. Reforestation on the working circle, ignored in the past, must be made an integral part of the management of the area if the present stands are to be perpetuated and improved. Inadequate seed sources, lack of soil moisture, a changing microclimate, and extensive areas of browse species have resulted in a severe lack of regeneration over the bulk of the commercial timbered area. Efforts will be made in the immediate future to develop effective means of planting in this type of country. During this plan period, 3,131 acres of nonstocked pine stands must be reforested in addition to the establishment of reproduction on planned regeneration areas.

Table 12.Possible Treatment Under Artificial Regeneration Program

Fiscal Years 1963 - 1972

Year	Treatment	Area to be Treated	Acres	M Trees
1964	Mech. Site Preparation	Laguna Seca	100	87
1964	Direct Seeding	Laguna Seca	1,000	
1965	Plant Nursery Stock	Laguna Seca	100	
1966	Mech. Site Preparation	Mestenas Mesa	200	174
1966	Direct Seeding	Mestenas Mesa	1,800	
1967	Plant Nursery Stock	Carracas Mesa	200	
1967	Mech. Site Preparation	Carracas Mesa	200	
1968	Direct Seeding	Carracas Mesa	1,900	

Rodent control will be carried out on the entire 5,000 acres to be treated on an area basis prior to actual planting or seeding.

C. Timber Stand Improvement

Cultural practices will be planned for compartments rather than for the working circle as a whole, because of the variety of stand conditions.

As plantations are established on the working circle, progress and results of spacing and thinning in these plantations will be carefully recorded and utilized in future phases of the overall T.S.I. program.

The 10-year thinning program for the working circle includes only 1,000 acres, about equally split between Carracas Mesa and Laguna Seca areas. This acreage makes up all of the presently overstocked stands on the working circle.

Pruning of 500 acres in these same two areas is planned during the same 10-year period. The incidence of dwarfmistletoe in the pine stands on Carracas Mesa will limit extensive pruning in this area.

Removal of competing species, such as oak, should be practiced as a means of site preparation on most of the commercial acreage of the working circle. This will be done with P&M funds.

D. Fire Control

A fire plan, in accordance with Regional standards, will be prepared for each advertised sale and will be revised as necessary and reviewed with the operator by the Forest officer in charge of the timber sale annually, to assure compliance with the sale contract and fire plan revisions.

Slash disposal plans will be prepared for each timber sale, regardless of size. Utilization of logging slash for gully-plugging, blocking of skid trails, and other erosion-control measures will be considered secondary only to fire protection. Ten-year fire records are included in Appendix, Table 24.

E. Rodent Control

Porcupine damage on portions of the working circle is severe. With the limited stocking of timber on the area, porcupine control must become more intensive. Hired hunters will be used where necessary and feasible. Large-scale control measures will be exercised in conjunction with the U.S. Fish and Wildlife Service if District-level control means prove inadequate to halt the damage.

Poisoning of rodents in seeded areas, plantations, and regeneration areas will be done prior to the actual treatment. In most cases, poisoning will have to be repeated at least once. Predators that will help keep rodent populations low following artificial control will be encouraged.

F. Animal Control

The high deer population of the area will have to be controlled in regeneration areas. Hunters should be directed to these areas whenever possible. Regeneration will be protected from domestic stock through proper stocking, distribution, salting, fencing of waters, and total exclusion, if necessary. Areas planned for regeneration measures will be brought to the attention of the Forest Supervisor three years prior to the beginning of actual ground work, in order that domestic grazing conflicts and other existing problems in animal use on the area may be anticipated and resolved.

End, Action Plan Section of
1963 Timber Management Plan
Jicarilla Working Circle
Carson National Forest

IX. INSECT AND DISEASE CONTROL

A. General Conditions

No serious timber losses due to insects are known in the history of the working circle.

Dwarfmistletoe, western red rot, and cronartium rust occur on ponderosa pine. Of these, dwarfmistletoe is the most widespread. A significant proportion of the pine stands on Carracas Mesa is infected in light to moderate degree.

Cronartium rust, though more deadly than dwarfmistletoe to individual trees, is less widespread and so it is not so great a problem in the area.

The greatest loss in sawtimber volume is due to western red rot, though it is far less conspicuous than dwarfmistletoe and seldom causes the death of infected trees.

B. Special Problems and Specific Direction for Handling Each Problem

1. Diseases

a. Dwarfmistletoe

Dwarfmistletoe is the dominant death-causing disease occurring on the working circle. It is present in the better stands of pine, primarily on Carracas Mesa. Mortality, however, is not so serious as is the loss of increment in infected trees. Intermediate cutting repeated every 20 years will make possible the salvage of most of the infected trees which would die during the cutting period. The primary problem, however, is not merely of salvaging infected trees but of restricting the spread of dwarfmistletoe and eventually clearing it from the stand. Periodic stand improvement operations can do much to aid in dwarfmistletoe eradication at relatively low cost. Infected trees in the overstory will be cut to prevent spread of the infection to younger stock. A 50-foot dwarfmistletoe-free strip around the infected stand may be necessary to prevent further spread of the disease if it has become established. Light infections in the limbs of small trees will be eradicated by pruning. Region 3 guidelines will govern practices for this dwarfmistletoe control program.

b. Red Rot

Red rot, caused by a fungus Polyporus ellisianus, is the greatest single disease causing loss in pine sawtimber volume on the working circle. Defect in the virgin stands averages about 30% of the total volume. Old trees, especially those bearing dead limbs on the lower portion of the bole, contain the greatest portion of heart rot encountered in logging. In some stands it is found in blackjacks as well, but not in

such serious proportions. Red Rot can be effectively curbed under present silvicultural methods.

(1) Shorter rotation: The planned 120-year rotation period eliminates the majority of the red rot once the initial cut is completed on the working circle. This item will be the greatest single means of controlling the disease.

(2) Maintain proper spacing where possible through the pole state to promote natural pruning.

(3) Reduce to a minimum the number of cull logs and down timber left in the woods. In the future these cull logs will not be of great importance as the disease is reduced.

(4) All commercial cutting should aim at improvement of boles to aid in the reduction of this disease. Potential red rot hosts can be spotted for removal by the presence of coarse limbs and the peculiar white mycelium in broken branches.

(5) Cutting should include all diseased trees near the edges of infected patches and small isolated patches should be clear-cut in order to check the spread of the disease.

2. Tree-killing Bark Beetles

Bark beetles on commercial species of sawtimber have never presented any serious problems on the working circle, although endemic populations are present. No known epidemic stage has ever been reached as a result of logging or fire. The scattered nature of the stands present is doubtless a major factor, although there are several areas where necessary conditions for such an epidemic do exist. These areas contain mainly overmature stands of ponderosa pine along the fringes of the type. In a few of these stands many small areas of pinyon pine are killed from time to time, but these have remained localized in the past. Future silvicultural practices will provide for effective methods of preventing epidemic buildups and controlling spread of these bark beetles through proper logging practices and treatment of attacked areas.

C. Handling abnormal Conditions

Prompt reporting of forest insect and disease outbreaks is of utmost importance so as to permit prompt followup to determine the need for or against suppression. The Regional Office will be notified of all such outbreaks. Specimens will be collected and submitted by field personnel whenever the situation warrants, in accordance with R-3 Supplement to the Handbook.

Detection survey and field surveillance will be conducted on a planned basis as needed to provide up-to-date information on insect conditions. These will include both ground and air surveys and should

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B. Statistics of Inventory

Statistics for the original extensive inventory made in 1957 are as follows:

1. Number of plots	$=N=$	88
2. Sum of Plot Volumes	$=\sum X=$	137,330
3. Sum of Squared Plot Volumes	$=\sum X^2=$	324,476,600
4. Square of Sum of Plot Volumes	$=\left(\sum X\right)^2=$	18,859,528,900
5. Mean Plot Volume	$=\bar{X}=$	1,561
6. Standard Deviation	$=S_2=$	1,119
7. Standard Error of Mean	$=S_{\bar{x}}=$	± 1.119
8. Percent of Error	$=A=$	$\pm 7.6\%$
9. Coefficient of Variation	$=C=$	72%

C. Timber DataTable 13.Commercial Acreage by Working Group, General Condition Class, and Forest Type

Working Group	General Condition Class	Forest Type - Acres		Total Acres
		Ponderosa Pine	Mixed-Conifer	
Technical	Virgin	28,236	352	28,588
	Cutover	<u>14,227</u>	<u>0</u>	<u>14,227</u>
Total		42,463	352	42,815
Administrative	Virgin	318	48	366
	Cutover	<u>526</u>	<u>0</u>	<u>526</u>
Total		844	48	892
Grand Total		43,307	400	43,707

Table 14.Commercial Net Volumes by Working GroupScribner, M Bd. Ft. 12"+ d.b.h.

Working Group	Forest Type	General Condition Class		Total
		Operable	Inoperable	
Technical	Ponderosa Pine	127,258	31,580	158,838
	Mixed-Conifer	<u>1,144</u>	<u>5,086</u>	<u>6,230</u>
Total		128,402	36,666	165,068
Administrative	Ponderosa Pine	2,532	0	2,532
	Mixed-Conifer	<u>155</u>	<u>0</u>	<u>155</u>
Total		2,687	0	2,687
Grand Total		131,089	36,666	167,755

Table 15.

Commercial, Operable Net Volumes by SpeciesScribner, M Bd. Ft. 12"+ d.b.h.

Working Group	Stand Condition	Ponderosa Pine			Douglas-Fir	Total
		Black-jack	Yellow Pine	Sub-Total		
Technical	Virgin	9,975	86,367	96,342	1,344	97,686
	Cutover	6,711	24,005	30,716	--	30,716
Total		16,686	110,372	127,058	1,344	128,402
Administrative	Virgin	160	1,151	1,311	65	1,376
	Cutover	443	868	1,311	0	1,311
Total		603	2,019	2,622	65	2,687
Grand Total		17,289	112,391	129,680	1,409	131,089

Table 16.

Gross Volumes per Acre by Type, Species, and Condition ClassBd. Ft. Scribner, 12"+ d.b.h.

Timber Type	Acres	Ponderosa Pine			Douglas-Fir	Total
		Yellow Pine	Black-jack	Sub-Total		
Pl-V	14,018	5,710	640	6,350	50	6,400
Pl=V	3,572	10,230	860	11,090	140	11,230
POV	2,723	2,240	800	3,040	0	3,040
MCl-V	375	2,680	220	2,900	2,060	4,960
MCl=V*	25	2,680	220	2,900	2,060	4,960
Pl-C	14,340	2,440	540	2,980	--	2,980
Pl=C	413	3,320	3,280	6,600	--	6,600
POC	408	2,240	800	3,040	--	3,040

*Insufficient plot data, volumes based on MCl-V.

Table 17.

Net Volumes per Acre by Type, Species, and Condition ClassBd. Ft. Scribner, 12"+ d.b.h.

Timber Type	Acres	Ponderosa Pine			Douglas-fir	Totals
		Yellow Pine	Black-jack	Subtotal		
Pl-V	14,018	3,712	480	4,192	32	4,224
Pl=V	3,572	6,650	645	7,295	91	7,386
POV	2,723	1,456	600	2,056	--	2,056
MCl-V	375	1,742	165	1,907	1,339	3,246
MCl=V	25	1,742	165	1,907	1,339	3,246
Pl-C	14,340	1,708	459	2,167	--	2,167
Pl=C	413	2,324	2,788	5,112	--	5,112
POC	408	1,456	600	2,056	--	2,056
Pl-X	5,002	4,537	540	5,077	--	5,077
Pl=X	265	4,537	540	5,077	--	5,077
Pl=X	12	4,537	540	5,077	--	5,077
MCl-X	1,397	1,742	165	1,907	1,339	3,246
MCl=X	170	1,742	165	1,907	1,339	3,246
POX	987	3,855	--	3,855	364	4,219

Forest Type Legend for Tables 16 and 17.

<u>Symbol Used</u>	<u>Meaning of Symbol</u>
P	Ponderosa Pine
MC	Mixed-Conifer
NO	Nontimbered
NC	Brush

<u>Size Class</u>	
0	Nonstocked
1	Sawtimber
2	Poles
3	Reproduction

<u>Stocking</u>	
-	Poorly stocked (10-39% crown density)
=	Moderately stocked (40-69% crown density)
≡	Well stocked (70-100% crown density)

<u>Condition</u>	
V	Virgin
C	Cutover
X	Inaccessible

Table 18.

Defect Factors Used to Reduce Inventory Volumes to Net

Species	Percent Defect	
	Virgin Stands	Cutover Stands
Ponderosa Pine - Yellow Pine	35	30
Ponderosa Pine - Blackjack	25	15
Douglas-Fir	35	--

D. Growth Calculations1. Growth Calculations - Region 3 Formula

The following growth calculation for poorly stocked cutover ponderosa pine stands is intended only as a check on estimated growth rates. The formulas were developed by the Southwestern Forest and Range Experiment Station and published in their report for 1952.

Local growth is not available for the Carson National Forest. However, remeasurement of the original plots in 1967 will provide accurate growth data, and any necessary adjustments in growth calculation will be made at that time. Actual calculations are in the files in the Carson National Forest Supervisor's office. A summation follows:

$$\begin{aligned}
 \text{Net growth} &= \text{Gross growth} + \text{ingrowth} - \text{mortality} \\
 &= 76.67 + 9.83 - 7.40 \\
 &= 79.10 \text{ less } 15\% \text{ for interior defect} \\
 &= 67.23 \text{ bd. ft. per acre per year net growth}
 \end{aligned}$$

2. Periodic Annual Increment

Normal mean annual growth per acre is expected in the Southwest if the basal area stocking per acre is maintained at levels lower than those of fully stocked stands. These levels are determined for ponderosa pine from Technical Bulletin 630, (14), and they are determined for Douglas-fir from Technical Bulletin 201, (15). The optimum stocking level is established as 57% of fully stocked basal area. The maximum stocking level is established as 80% of fully stocked basal area.

At present, the actual stands average 62% understocked in relation to the established optimum stocking level. A portion of the cubic-foot periodic annual growth will be left on stems as a means of building the basal area stocking toward the optimum level.

The optimum stocking level for the forest stands of this working circle is 57% of basal area full stocking. Through growth, basal area may

be increased to 80% of full stocking. At this level, the stands will be thinned or there will be a precommercial cut to reduce the basal area to the optimum 57%.

Basal area stand tables were prepared for each overstory forest type and density class which was mapped on the working circle. Table 22 summarizes actual stand basal areas by diameter class.

The average number of trees per acre by overstory type and density class are summarized in Table 23 by diameter class.

Because of the lack of an adequate sample in the medium density stands of mixed-conifer, the figures shown in both tables are taken from data based on the poor density stands. This results in a corresponding conservative estimate in this type.

Table 19.

Calculation of Periodic Annual Growth
 Jicarilla Working Circle
 Carson National Forest

Forest Type	Stock- ing Class in % of Crown Cover	1/		2/	3/	4/	5/		Working Circle Periodic			
		Acres		Basal Area at Full Stock- ing Sq.Ft.	57% of Full Stock- ing Basal Area Sq.Ft.	Actual Basal Stock- ing Area Sq.Ft.	Per- cent of Actual to 57% Basal Area	Per Acre Periodic Annual Growth as Derived from Mean Annual Growth		Annual Growth Bd.Ft., Scribner		
		110- Yr. Rota- tion Age	190- Yr. Rota- tion Age					110-Yr. Age Bd. Ft.	190-Yr. Age Bd. Ft.	110- Yr. Age	190- Yr. Age	
								147 Mean	170 Mean			
<u>Ponderosa Pine</u>												
Nonstocked			3,131					63.2	73.1	865,840	23,246	
Virgin Sawtimber	Poor		13,700	318	184	104.9	45.08	42.97	104.7	373,988	0	
Virgin Sawtimber	Med.		3,572	0	184	104.9	74.71	71.22	32.3	37.4	450,553	14,623
Cutover Sawtimber	Poor		13,949	391	184	104.9	23.08	22.00	95.1	109.9	26,438	14,837
Cutover Sawtimber	Med.		278	135	184	104.9	67.83	64.66	49.6	62.4	1,716,819	52,706
Total			34,630	844			Weighted Average	49.9		1,769,525		
			35,474					172 Mean	199 Mean			
<u>Mixed-conifer</u>												
Virgin Sawtimber	Poor		327	48	216	123.1	56.23	45.68	78.6	90.9	25,702	4,363
Virgin Sawtimber	Med.		25	0	216	123.1	56.23	45.68	78.6		1,965	0
Total			352	48			Weighted Average	78.6	90.9	27,667	4,363	
			400					80.1		32,030		
<u>Grand Totals</u>			34,982	892				49.9	64.0	1,744,486	57,069	
			35,874					50.2		1,801,555		

- 1/ 110-year rotation age, 120-year rotation period for Technical Group. 190-year rotation age, 200-year rotation period for Administrative Working Group
- 2/ From Table 4, Technical Bulletin 630, for Ponderosa Pine, Average Site Index 70
 Average Sawtimber - 105 years
 From Table 2, Technical Bulletin 201, for Mixed-conifer, Average Site Index 90
 Average Sawtimber - 105 years
- 3/ From Stand Tables compiled from inventory data.
- 4/ Actual basal area stocking divided by 57% of full basal area stocking.
- 5/ Mean annual growth for ponderosa pine from Table 25, Technical Bulletin 630, average Site Index 70.
 Mean annual growth for mixed-conifer, computed from Table 4, Technical Bulletin 201, Average Site Index 90.
 Anticipated periodic annual growth per acre determined by multiplying the actual percent of basal area stocking by the mean annual growth.

Table 20.

Periodic Annual Growth by Working Group
Jicarilla Working Circle
Carson National Forest

Forest Type	Stocking Class in % Crown Cover	Technical Working Group		Administrative Working Group	
		Acres	Growth Bd. Ft.	Acres	Growth Bd. Ft.
<u>Ponderosa Pine</u>					
Nonstocked		3,131			
Cutover Sawtimber	Poor	13,949	450,553	391	14,623
Cutover Sawtimber	Medium	278	26,438	135	14,837
Virgin Sawtimber	Poor	13,700	865,840	318	23,246
Virgin Sawtimber	Medium	3,572	373,988	--	--
<u>Mixed-Conifer</u>					
Virgin Sawtimber	Poor	327	25,702	48	4,363
Virgin Sawtimber	Medium	25	1,965	--	--
Working Group Totals		34,982	1,744,486	892	57,069

3. Calculation of Potential Mean Annual Growth

The per acre mean annual growth data was taken from USDA Technical Bulletin 630 for ponderosa pine, and from USDA Technical Bulletin 201 for Douglas-fir.

Predictions for the working circle were computed as follows:

Table 21.
Mean Annual Growth Predictions for the Jicarilla Working Circle

Forest Type	Rotation Age (Year)	Rotation Period (Years)	Mean Annual Growth/Acre (Scribner) Bd. Ft.	Acres	Working Circle Mean Annual Growth (Scribner) Bd. Ft.
Ponderosa Pine	110	120	147	34,630	5,090,610
Ponderosa Pine	190	200	170	844	143,480
Mixed-Conifer	110	120	172	352	60,544
Mixed-Conifer	190	200	199	48	9,552
Totals				35,874	5,304,186

The Site Index 70 for ponderosa pine is based on comparable areas within the Carson National Forest where site index information is available.

This prediction could be raised or lowered depending upon the future determination of acreage for each site index present in the working circle, based upon individual compartment examinations.

The average 100-year site index was determined to be 70 on ponderosa pine for the ponderosa pine forest type. The average 100-year site index was determined to be 90 on Douglas-fir for the mixed-conifer forest type. Mean annual growth was calculated by site and by rotation age. The total mean annual growth and annual harvest potential is established at 5,304 M bd. ft., Scribner, for sawtimber on the working circle.

E. Calculation of Allowable Annual Cut

The available cut was determined by calculating the periodic annual growth for the working circle, based on stand table data. Therefore, the current plan period cut will be equal to planned net Scribner board feet increment during the same period.

This method was favored over a strict analysis of stand tables for stocking classes, with excess basal area removed. All current, reputable data indicate that on this working circle no correlation exists between basal area by diameters and volume which must be removed in the form of decadent stems. This results from the fact that the bulk of the present volume exists in stems of large diameter with a marked absence of trees in all lower diameter classes.

Since this plan is based on area regulation, the stands as found will be placed in the best silvicultural condition possible. The cut will then come about normally, as the area entered will be varied to sustain an approximate average yield of sawtimber volume. At the end of a 5-year period, experience data can be used for adjustment and application to a future cutting budget. Present calculations are intended only as a sound, reasonable guide based on the best knowledge presently at hand and are meant to provide a basis for planning the expected yield.

The actual data used in the calculations are found in the files of the Forest Supervisor's Office, on the Carson National Forest.

1. Calculation of Area Control

Total operable acres in working circle	35,874
20-year cutting period	20
Average No. of acres to enter each year	1,794

2. Regeneration Area Calculation

Item	Technical Working Group		Administrative Working Group
	Ponderosa Pine	Mixed-Conifer	
Acres in each working group	34,630	352	892
Number of cutting periods	+ 6	+ 6	+ 10
Acres needed each cutting period	5,772	59	89
Acres of nonstocked to be planted	<u>-3,131</u>		
	2,641		
	59		
	89		
Total acres needed this cutting period	2,789		
20-year cutting period	+ 20		
Acres to receive regeneration cuts annually	140		

3. Calculation of Volume to Cut from Regeneration Cut Acreage

	Technical Working Group			Administrative Working Group
	MCI=V	PI=V	PI=V	PI=V
Average net volume per acre bd.ft.	3,246	4,221	7,387	4,221
Average No. of acres to cut annually	<u>3</u>	<u>(80%)106</u>	<u>(20%)26</u>	<u>5</u>
	9,738	447,426	192,062	21,105
Reserve average of 30% of volume for seed trees	<u>2,921</u>	<u>134,228</u>	<u>57,619</u>	<u>6,332</u>
Average net volume to cut annually bd. ft.	6,817	313,198	134,443	14,773
	313,198			
	134,443			
	<u>14,773</u>			
Total average net volume to cut annually from the working circle, regeneration acreage	469,231 bd. ft.,	Scribner		
Rounded to:	470,000 bd. ft.,	Scribner		

4. Volume to Cut from Intermediate Cut Acreage

Working Circle Annual Allowable Cut	1,800,000 bd.ft.,	Scribner
Volume to Cut from Regeneration Cut Acreage	<u>470,000</u>	" " "
Volume to cut from Intermediate Cut Acreage	1,330,000	" " "

5. Intermediate Cut Acreage

Average No. of Acres to Enter Each Year	1,794
Average No. of Regeneration Cut Acres This Cutting Period	<u>140</u>
Average No. of Intermediate Cut Acres	1,654

F. Stand TablesTable 22.Stand Basal Area per Acre by Diameter Class

Map Symbol	Forest Type	Stocking Class in % Crown Cover	Average Basal Area Per Acre in Sq. Ft. by diameter Class				Total
			4-7"	8-11"	12-20"	21"+	
	<u>Ponderosa Pine</u>						
Pl-V	Virgin Sawtimber	Poor	.92	1.84	16.06	26.26	45.08
Pl=V	Virgin Sawtimber	Medium	.82	8.24	19.78	45.87	74.71
Pl-C	Cutover Sawtimber	Poor	0	1.11	9.65	12.32	23.08
Pl=C	Cutover Sawtimber	Medium	0	12.05	42.12	13.66	67.83
	<u>Mixed-Conifer</u>						
MCl-V	Virgin Sawtimber	Poor	7.03	9.87	18.68	20.65	56.23
MCl=V	Virgin Sawtimber	Medium	7.03	9.87	18.68	20.65	56.23

Table 23.Stand Number of Trees per Acre by Diameter Class

Map Symbol	Forest Type	Stocking Class in % Crown Cover	Average No. of Trees per Acre in Sq.Ft. by Diameter Class				Total
			4-7"	8-11"	12-20"	21"+	
	<u>Ponderosa Pine</u>						
Pl-V	Virgin Sawtimber	Poor	5.00	3.70	11.22	7.39	27.31
Pl=V	Virgin Sawtimber	Medium	5.00	15.00	16.00	12.00	48.00
Pl-C	Cutover Sawtimber	Poor	--	2.00	5.87	4.00	11.87
Pl=C	Cutover Sawtimber	Medium	--	20.00	32.00	4.00	56.00
	<u>Mixed-Conifer</u>						
MCl-V	Virgin Sawtimber	Poor	44.44	20.00	15.12	5.77	85.33
MCl=V	Virgin Sawtimber	Medium	44.44	20.00	15.12	5.77	85.33

G. Records1. Record of Timber CutTable 24.Annual Cuts of Timber, 1936 to December 1962

<u>YEAR</u>	<u>VOLUME CUT</u>	<u>ACRES</u>
1936	3,397,240	800
1937	5,901,360	1,500
1938	3,894,140	1,000
1939	290	1
1946	97,540	50
1947	317,890	200
1948	477,870	300
1949	823,740	650
1950	2,384,120	(
1951	1,977,230	(
1952	1,379,820	(5,093
1953	217,040	(
1954	421,000	160
1955	217,000	50
1956	43,000	100
1957	62,330	10
1958	74,000	12
1959	11,000	3
1960	204,000	200
1961	3,434,000	2,724
1962	2,212,000	1,900
TOTALS	27,546,610	14,753

2. Fire Statistical SummaryTable 25.Fire Statistics

<u>Year</u>	<u>No. Fires By Size Class</u>					<u>No. Fires By Causes</u>			<u>Acres Burned</u>
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>Light</u>	<u>Timber</u>	<u>Other M.C.</u>	
1953	6					4		2	1.3
1954	2					2		0	0.5
1955	2					2		0	.5
1956	12	2	1			9		6	19.0
1957	1	1				2		0	1.5
1958	19					2		17	2.5
1959	99	3				8		94	11.0
1960	16	3				9		10	3.0
1961	15	1				10		6	2.5
1962	4					4		0	2.0
TOTAL	176	10	1			52		135	43.8

Annual average acreage burned = 4.4 acres

Table 26.

Compartment Examination Schedule and Budget of Entry
Jicarilla Working Circle
Carson National Forest

F.Y. 1963 Through F.Y. 1972

Fiscal Year For Examination	Block (District) Name	Compartment Number Name		Purpose of Next Entry into Compartment			
				Anticipated Type Of Stand Treatment	Budget Control		
					Net N.F. Acres	Budgeted Acres	Budgeted F.Y.
1966	Jicarilla	3	001	Initial Cut	1,975	1,975	1969
1966	"	3	002	" "	1,195	1,195	1969
1966	"	3	003	" "	1,661	1,661	1969
1966	"	3	004	" "	1,221	1,221	1969
1966	"	3	005	" "	1,253	1,253	1969
1966	"	3	006	" "	1,784	1,784	1969
1966	"	3	007	" "	748	748	1969
1966	"	3	008	" "	1,382	1,382	1969
1966	"	3	009	Salvage Cut	1,214	1,214	1969
1966	"	3	010	" "	1,919	1,919	1969
1966	"	3	011	Initial Cut	1,611	1,611	1970
1966	"	3	012	" "	1,388	1,388	1970
1966	"	3	013	" "	940	940	1970
1967	"	3	014	" "	2,021	2,021	1970
1967	"	3	015	Salvage Cut	1,817	1,817	1970
1967	"	3	016	Initial Cut	1,964	1,964	1970
1967	"	3	017	" "	1,868	1,868	1971
1967	"	3	018	" "	1,585	1,585	1971
1967	"	3	019	" "	1,708	1,708	1971
1967	"	3	020	" "	1,189	1,189	1971
1967	"	3	021	" "	1,535	1,535	1971
1967	"	3	022	" "	1,874	1,874	1971
1967	"	3	023	" "	1,425	1,425	1971
1967	"	3	024	" "	1,465	1,465	1971
1967	"	3	025	" "	1,703	1,703	1971
1967	"	3	026	Salvage Cut	2,079	2,079	1982
1967	"	3	027	" "	1,706	1,706	1982
1968	"	3	028	" "	1,950	1,950	1982
1968	"	3	029	" "	1,868	1,868	1982
1968	"	3	030	" "	1,931	1,931	1982
1968	"	3	031	Initial Cut	2,379	2,379	1972
1968	"	3	032	" "	1,143	1,143	1972
1968	"	3	033	" "	1,534	1,534	1972
1968	"	3	034	" "	1,162	1,162	1972
1968	"	3	035	" "	1,100	1,100	1972
1968	"	3	036	" "	1,254	1,254	1972
1968	"	3	037	" "	939	939	1972
1968	"	3	038	" "	1,995	1,995	1972
1968	"	3	039	" "	908	908	1972
1969	"	3	040	" "	1,611	1,611	1972
1969	"	3	041	" "	1,887	1,887	1972
1965	"	3	042	" "	1,990	1,990	1972
1969	"	3	043	" "	1,894	1,894	1974
1965	"	3	044	" "	1,498	1,498	1974
1969	"	3	045	" "	1,560	1,560	1974
1965	"	3	046	" "	1,247	1,247	1974
1965	"	3	047	" "	1,960	1,960	1974
1965	"	3	048	" "	1,516	1,516	1974
1965	"	3	049	" "	1,079	1,079	1974
1965	"	3	050	" "	1,708	1,708	1974
1965	"	3	051	" "	1,105	1,105	1974
1965	"	3	052	" "	1,785	1,785	1974
1965	"	3	053	" "	1,579	1,579	1974
1965	"	3	054	" "	721	721	1974
1969	"	3	055	Salvage Cut	1,790	1,790	1983
1969	"	3	056	Intermediate Cut	990	990	1983
1969	"	3	057	" "	997	997	1983
1969	"	3	058	" "	1,247	1,247	1983
1969	"	3	059	" "	1,350	1,350	1983
1969	"	3	060	" "	2,001	2,001	1983
1969	"	3	061	Salvage Cut	1,720	1,720	1983
1969	"	3	062	Intermediate Cut	870	870	1984
1970	"	3	063	" "	1,350	1,350	1984
1970	"	3	064	" "	1,253	1,253	1984
1970	"	3	065	" "	1,190	1,190	1984
1970	"	3	066	" "	1,945	1,945	1984
1970	"	3	067	" "	1,408	1,408	1984
1970	"	3	068	" "	849	849	1984
1970	"	3	069	" "	1,094	1,094	1984
1970	"	3	070	" "	1,318	1,318	1984
1970	"	3	071	Salvage Cut	1,228	1,228	1984
1970	"	3	072	Intermediate Cut	1,201	1,201	1984
1970	"	3	073	" "	858	858	1985
1970	"	3	074	" "	1,010	1,010	1985
1971	"	3	075	" "	1,470	1,470	1985
1965	"	3	076	Initial Cut	980	980	1965
1965	"	3	077	" "	742	742	1965
1965	"	3	078	" "	843	843	1965
1965	"	3	079	" "	1,355	1,355	1965
1965	"	3	080	" "	1,394	1,394	1965
1965	"	3	081	" "	1,163	1,163	1965
1965	"	3	082	" "	1,254	1,254	1965
1963	"	3	083	" "	1,125	1,125	1963
1963	"	3	084	" "	1,503	1,503	1963
1963	"	3	085	" "	1,318	1,318	1963
1963	"	3	086	" "	1,542	1,542	1963
1964	"	3	087	" "	1,497	1,497	1964
1964	"	3	088	" "	1,138	1,138	1964
1964	"	3	089	" "	1,286	1,286	1964
1964	"	3	090	" "	1,592	1,592	1964
1964	"	3	091	" "	1,017	1,017	1964
1964	"	3	092	" "	914	914	1964
1964	"	3	093	" "	1,580	1,580	1964
1964	"	3	094	" "	1,241	1,241	1964
1964	"	3	095	" "	729	729	1965
1964	"	3	096	" "	1,079	1,079	1965
1971	"	3	097	Salvage Cut	881	881	1982
1971	"	3	098	" "	1,553	1,553	1982
1964	"	3	099	Initial Cut	1,170	1,170	1965
1964	"	3	100	" "	1,561	1,561	1965
1964	"	3	101	" "	1,189	1,189	1965
1965	"	3	102	" "	972	972	1965
1965	"	3	103	" "	1,132	1,132	1965
1971	"	3	104	Salvage Cut	1,694	1,694	1973
1972	"	3	105	" "	1,273	1,273	1973
1972	"	3	106	Intermediate Cut	1,195	1,195	1973
1972	"	3	107	" "	1,260	1,260	1973
1972	"	3	108	Salvage Cut	914	914	1973
1972	"	3	109	" "	1,727	1,727	1973
1972	"	3	110	" "	2,374	2,374	1973
1972	"	3	111	Intermediate Cut	1,649	1,649	1973
1972	"	3	112	Salvage Cut	1,036	1,036	1973
1972	"	3	113	" "	1,362	1,362	1973

I. Maps (In attached binder)

1. Sawtimber Harvest Program and Transportation Map
2. Compartment Map
3. Working Group Map
4. Thinning Area and Pruning Area Map
5. Planting Area and Seeding Area Map